

# Work Order ID 50981

July 28, 2009 1:55:35 PM



Page 1

Item ID: D212-664-101

Accept



Setup Start



Revision ID: C

Stop



Item Name: Crosstube Fwd

Start Date: 7/30/09 Start Qty: 1.00



Cust Item ID:

Required Date: 8/14/09 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan: *W*

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

Draw Nbr

Revision Nbr

D212-664-141

Rev C

100

0.00



DC

Document Control

DOCUMENT CONTROL

Memo

Photocopy bluefile and create labels as per PPP D212-664-101 CHG003

*for BG 09/09/01*

*8/02/01*

110

Pick Kit

0.00



Packaging

Packaging

Memo

0.00

Packaging

*Per 8/31 (1)*

120

0.00



CNC Bend 2

BENDING MACHINE - CROSSTUBES

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D212-664-141 using CNC bender program 212-fw and Folio FT015

*9-8-14*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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**NOTE:** Date & initial all entries

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Customer:

Reference:

Approvals: Process Plan: Date: Tooling: Date:

QC: Date: SPC (Y/N): Date:

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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130



QC

Quality Control

QC15- Crosstube Dimensional Check

0.00

Memo

0.00

140



Crosstubes

Crosstubes

Crosstubes

Memo

1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549

2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-141

D R 9/8-14

AWW 9.8.17

65-0814

W/O:		WORK ORDER CHANGES					
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Stop



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat within 24 hours of bending and drilling

1 ~~0~~ ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~6~~ ~~7~~ ~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~12~~ ~~13~~ ~~14~~ ~~15~~ ~~16~~ ~~17~~ ~~18~~ ~~19~~ ~~20~~ ~~21~~ ~~22~~ ~~23~~ ~~24~~ ~~25~~ ~~26~~ ~~27~~ ~~28~~ ~~29~~ ~~30~~ ~~31~~ ~~32~~ ~~33~~ ~~34~~ ~~35~~ ~~36~~ ~~37~~ ~~38~~ ~~39~~ ~~40~~ ~~41~~ ~~42~~ ~~43~~ ~~44~~ ~~45~~ ~~46~~ ~~47~~ ~~48~~ ~~49~~ ~~50~~ ~~51~~ ~~52~~ ~~53~~ ~~54~~ ~~55~~ ~~56~~ ~~57~~ ~~58~~ ~~59~~ ~~60~~ ~~61~~ ~~62~~ ~~63~~ ~~64~~ ~~65~~ ~~66~~ ~~67~~ ~~68~~ ~~69~~ ~~70~~ ~~71~~ ~~72~~ ~~73~~ ~~74~~ ~~75~~ ~~76~~ ~~77~~ ~~78~~ ~~79~~ ~~80~~ ~~81~~ ~~82~~ ~~83~~ ~~84~~ ~~85~~ ~~86~~ ~~87~~ ~~88~~ ~~89~~ ~~90~~ ~~91~~ ~~92~~ ~~93~~ ~~94~~ ~~95~~ ~~96~~ ~~97~~ ~~98~~ ~~99~~ ~~100~~

160

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

35 09/08/17

76 ~~0~~

170

Outsource process - NDT per QSI038 4.1

0.00



Outsource2

Memo

0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 038  
Issue P/O: 10220  
LPI as per ASTM 1417 Level 2  
Attach copy of NDT results to work order

CL 09/08/19 ①

W/O:		WORK ORDER CHANGES					
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Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

180



Packaging

Packaging

Receive & Inspect for Damage & Mat'l Certs  
Packaging

Memo

Ensure copy of NDT results attached to work order.

0.00

0.00

*8/2/09*

190



QC

Quality Control

QC5- Inspect part completeness to step on W/O

Memo

Inspect for damage &amp; ensure results are as per Dwg D212-664-141

0.00

0.00

*MA 09 08 19 0*

W/O:		WORK ORDER CHANGES					
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Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

200

Spray Painting per QSI005 4.2  
SprayPaint

0.00



SprayPaint

Memo

0.00

Spray Painting

1-Prime inside and outside crosstube as per QSI 005 4.2  
2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: 7:00

Finish Time: 9:00

PAINT:

Start Time: 3:00

Finish Time: 4:15

IT 09-08-20

210

QC14- Inspect Spray Paint

0.00



QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

M 09 08 21 11

W/O:		WORK ORDER CHANGES					
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Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

220

0.00

Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe  
2-Install supports with magnobond as per QSI 015 Adhere for for 12 Hrs  
A/R 6398 Magnobond Batch: 111249 exp: 02/2010

08 08 27 ①

Torque: 08 08 28 ① m

230

QC5- Inspect part completeness to step on W/O

0.00

QC

Memo

0.00

Quality Control

=> S 02/08/31

④

240

Pick Kit

0.00

Packaging

Memo

0.00

Packaging

29/8/31 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Cust Item ID:

Required Date: 8/14/09 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Stop



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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250

QC4- 100% Inspect kits for completeness

0.00

=&gt; 8/1/09



QC

Memo

0.00

Quality Control



p

260

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-101

PO 9/9/2 ①

270

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

09/09/02

Bl 09-9-2

B50981

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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**NOTE:** Date & initial all entries

# Picklist Print

July 28, 2009 1:55:35 PM

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Work Order ID: 50981

Parent Item: D212-664-101RevC

Parent Item Name: Crosstube Fwd

Comments:

Start Date: 7/30/09

Required Date: 8/14/09

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D212-664- 101TRNRevC		Manufactured	No			110	Each	2.0000	1.0000			



Crosstube Turning Detail



B-50569 MB 07-08-14

Warehouse                      Loc Qty                      Loc Code  
Location

Main Warehouse

FG

2

50568

1

50569

1

D3595-063-450RevA

Manufactured

No

220

Each

47.8000

4.2105



RUBBER CUSHION

Warehouse                      Loc Qty                      Loc Code  
Location

Main Warehouse

ST

47.8

38959

2

43210

4.8

46465

41

MA 07 08 27

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Parent Item Name: Crosstube Fwd

Comments:

Start Date: 7/30/09

Required Date: 8/14/09

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
MS21920-25		Purchased	No			220	Each	156.0000	4.0000			
Clamp(per MIL-DTL-8783C)												

Warehouse                      Loc Qty                      Loc Code  
Location

Main Warehouse

ST	156	
107456	2	
108111	3	
108975	17	
109181	48	
109644	10	
111282	50	
111429	25	
111883	1	

*mm 08 08 27*

D2893-1RevB

Manufactured No

220

Each

72.0000

2.0000



2.75 Support

Warehouse                      Loc Qty                      Loc Code  
Location

Main Warehouse

ST	72	
25657	6	
43479	10	
46488	18	
47109	18	
47637	20	

*mm 08 08 27*

W/O:		WORK ORDER CHANGES					
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D3428-1RevA  Placard		Manufactured	No			250	Each	56.0000	1.0000 ✓		09/11/31	

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST

16

47310

6

48359

10

Main Warehouse

ST096

40

50790

40

50790

AN6-35A

Purchased

No

250

Each

34.0000

4.0000 ✓

BOLT

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST

34

111605

34

m112314 2x  
m111605 2x

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Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES					
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Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
S AN6-36A  Bolt		Purchased	No			250	Each	69.0000	4.0000 ✓		P09/8/31	

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
Main Warehouse		
ST	69	
109632	1	
110382	18	
111650	50	

S MS21042L6  Nut		Purchased	No			250	Each	755.0000	6.0000 ✓		M11/600	
--	--	-----------	----	--	--	-----	------	----------	----------	--	---------	--

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
Main Warehouse		
ST	755	
105077	22 Q	
110002	233	
111548	100	
111578	400	

W/O:		WORK ORDER CHANGES					
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AN960JD616  Washer		Purchased	No			250	Each	326.0000	18.0000	✓		

69/8/31 (1)

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST

326

m/12314

107242

3

107959

6

109371

8

110704

23

111193

18

111607

268

Q

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

W/O:		WORK ORDER CHANGES					
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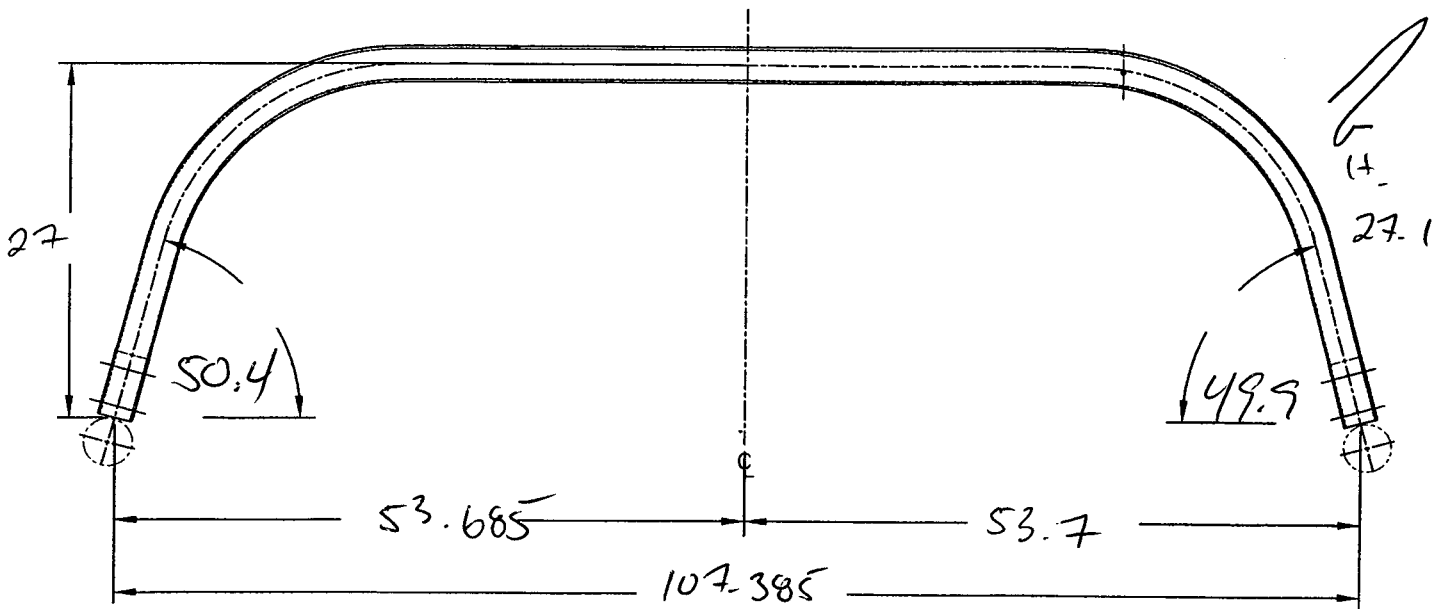
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



<b>DART AEROSPACE LTD</b>		<b>Work Order:</b>	B-50981
<b>Description:</b> Crosstube High Fwd (205/212/412)		<b>Part Number:</b>	D212-664-101
<b>Inspection Dwg:</b> D212-664-141 <b>Rev:</b> C			<b>Page 1 of 1</b>

Required Dimension	Min	Max
Height	26.79	27.05
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.7



Comments

QC15 Inspection	<i>[Signature]</i>
Date	09.08.14

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.31	Dimensions updated per Dwg Rev C	KJ/JM	

**DART****RELEASED**

07.04.24

**DEO ATTACHED**

DESIGN <b>PH</b>	DRAWN BY <b>PH</b>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED <b>QP</b>	APPROVED <b>PH</b>	DRAWING NO. D212-664-141	REV. C SHEET 1 OF 3
DATE 07.03.08		TITLE XTUBE ASS'Y (205/212/412 HI FWD) NTS	
A	00.12.12	NEW ISSUE	
B	05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	
C	07.03.08	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	

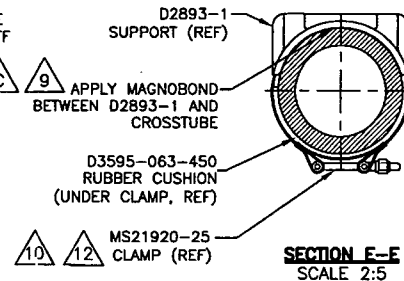
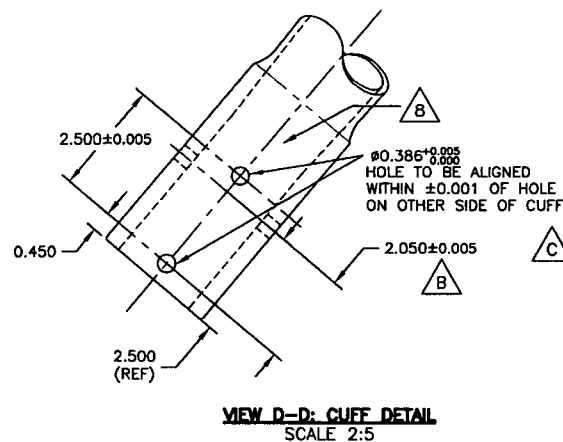
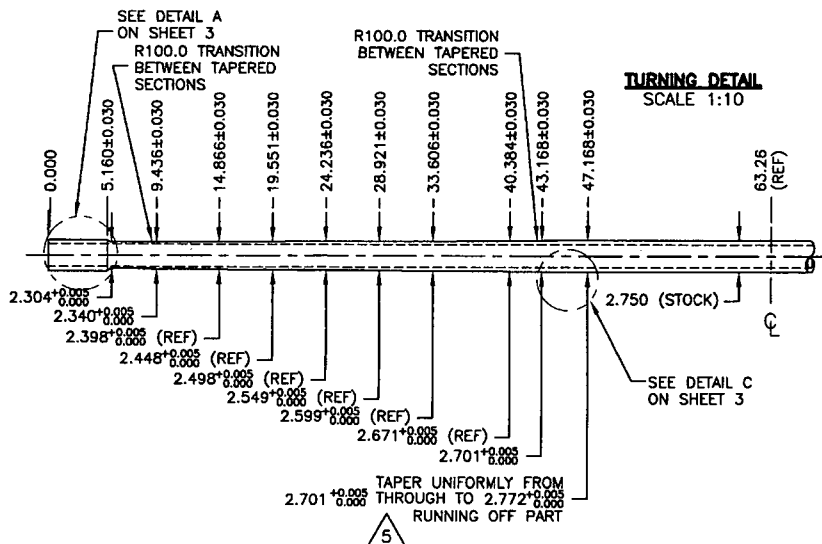
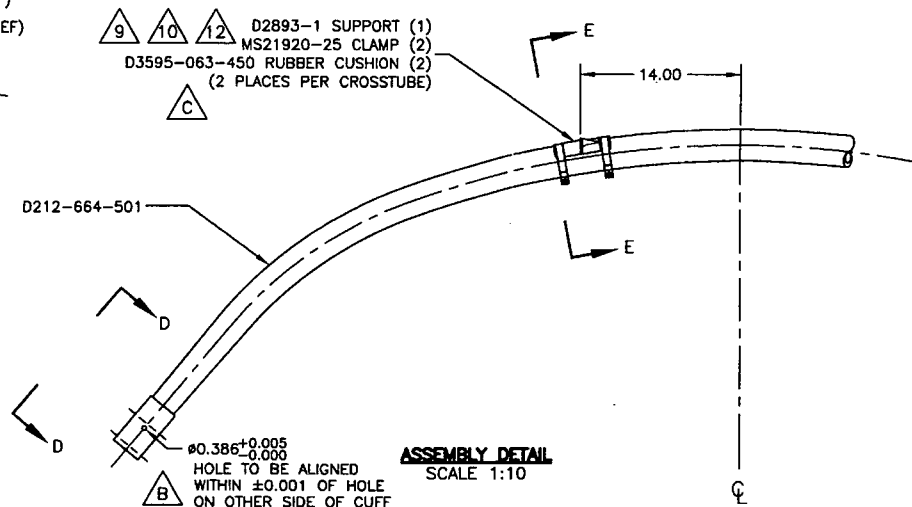
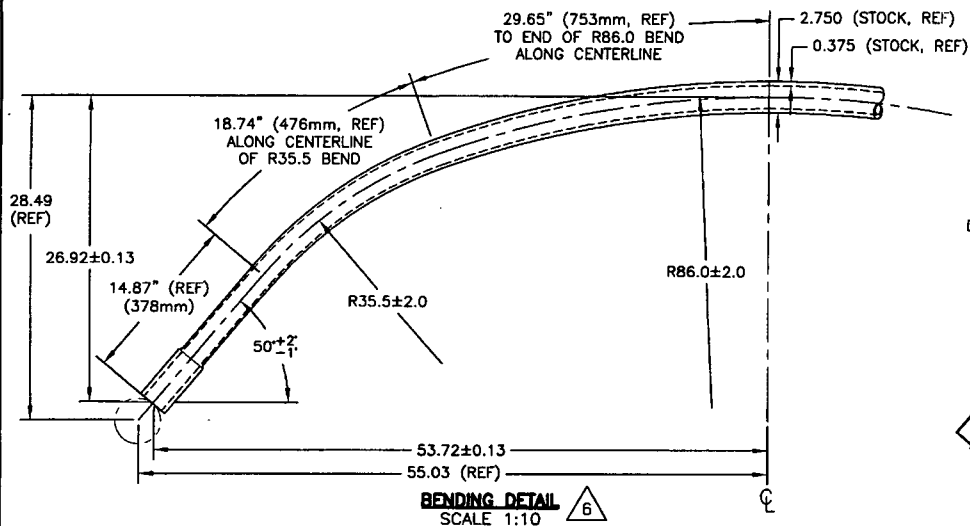
Qty	Part Number	Description
X	D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
1	D6005-128	CROSSTUBE
2	D2893-1	SUPPORT
4	D3595-063-450	RUBBER CUSHION
4	MS21920-25	CLAMP (OR MS21920-26)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6005-128  
FINISHED LENGTH = 126.51±0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 10) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT
- 11) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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RELEASED

07.04.24

NO ATTACHED

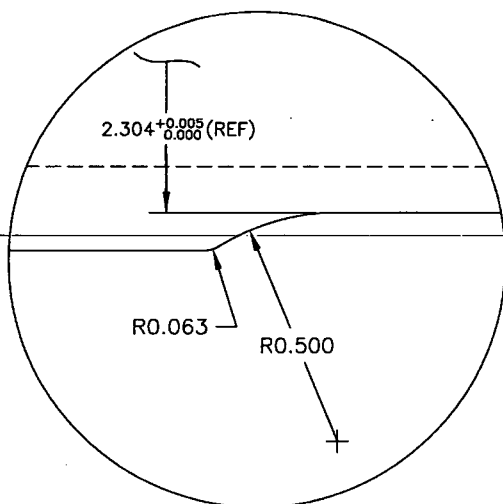
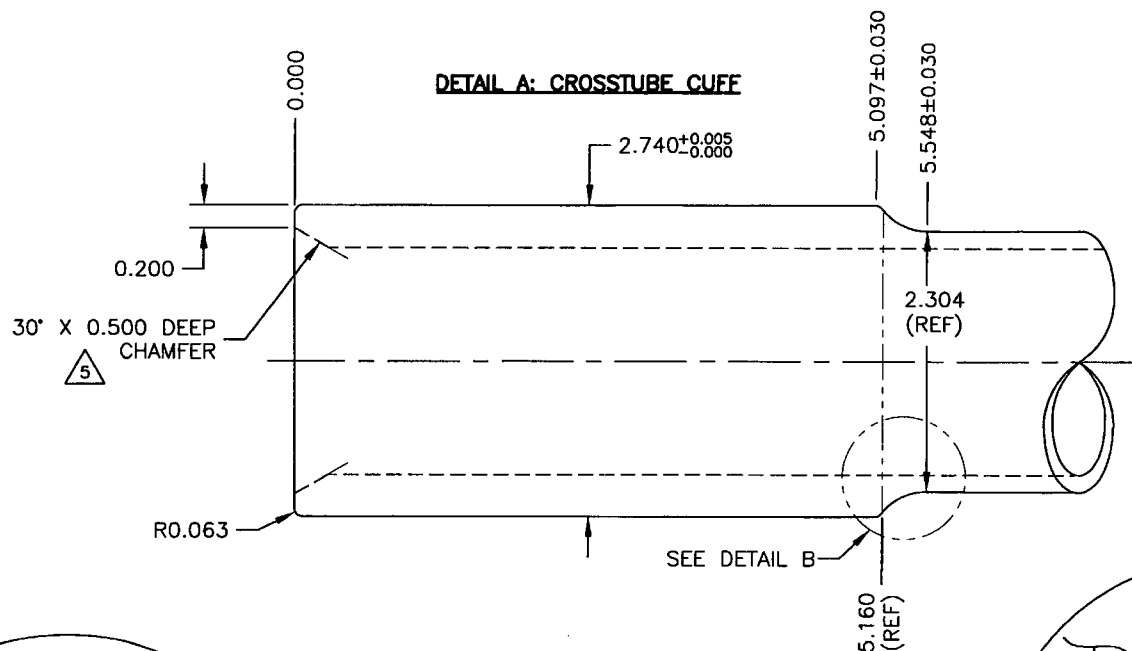
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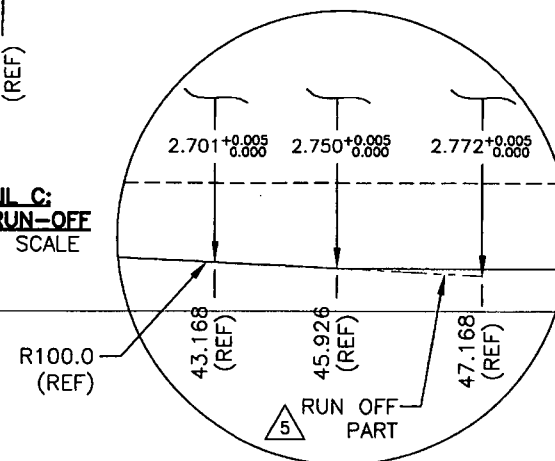
DESIGN	PH	DRWN BY	PH	<b>DART</b>	DART AEROSPACE LTD. HARRISBURG, ONTARIO, CANADA
CHECKED	99	APPROVED	4	DRAWING NO.	D212-664-141
DATE	07.03.08	TITLE	XTUBE ASS'Y (205/212/412 HI FWD)	REV. C	SHEET 2 OF 3
				SCALE	1:10

RELEASED  
97.04.24 (P)  
PER ELM 897

DEO ATTACHED



**DETAIL C: TAPER RUN-OFF**  
NOT TO SCALE



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DESIGN PH	DRAWN BY PH	<b>DART</b>	DART AEROSPACE LTD. HAMPSHIRE, ENGLAND, CANADA
CHECKED J	APPROVED J	DRAWING NO. D212-664-141	REV. C SHEET 3 OF 3
DATE 07.03.08	TITLE XTUBE ASS'Y (205/212/412 HI FWD)	SCALE 1:1	

DRAWING NO. D212-664-141	TITLE CROSSTUBE	REV. C	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-141-C-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>W</i>	CHECKED <i>R</i>	MFG. APPR. <i>E</i>	APPROVED <i>W</i>		DE APPR. <i>#</i>		
DATE 09.05.01	DATE 09.06.15	DATE 09.06.15	DATE 09/06/16		DATE 09/06/16		

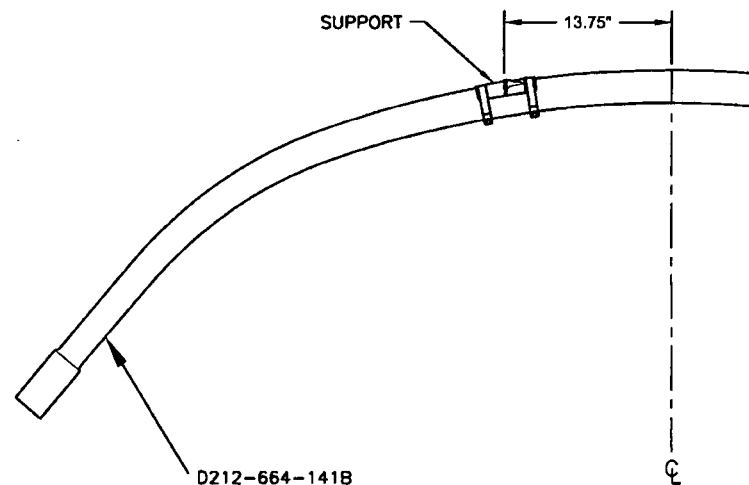
**CHANGE:**

ADD THE FOLLOWING CROSSTUBE ASSEMBLY:

Part Number	Description
D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)

THE D212-664-141B CROSSTUBE HAS THE SAME PARTS LIST AS THE D212-664-141 CROSSTUBE. HOWEVER, INSTALL THE SUPPORTS AS SHOWN IN FIGURE 1 OF THIS ENGINEERING ORDER. THE NEW KIT IS OTHERWISE ASSEMBLED PER THE D212-664-141 CROSSTUBE.

**RELEASED**  
*CM/06/22*



**FIGURE 1 - SUPPORT INSTALLATION**

## REFERENCE ONLY

## 5.0 PARTS LIST

## 5.1 HIGH GEAR CROSSTUBES

Item	-101	-201	-203	Part Number	Description
	X			D212-664-101	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
		X		D212-664-201	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
			X	D412-664-203	CROSSTUBE INSTALLATION, 412 HIGH AFT
1	1			D212-664-141	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
2		1		D212-664-241	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
3			1	D412-664-243	CROSSTUBE ASSEMBLY, 412 HIGH AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
14	4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	18			AN960JD616	WASHER
20		2		* D2940-1	SUPPORT
21		4		* D3595-063-530	RUBBER CUSHION
22		4		* MS21920-28	CLAMP (OR MS21042-30)
23		4		AN6-40A	BOLT
24		2		AN6-41A	BOLT
25		6		MS21042L6	NUT (OR MS21042-6)
26		18		AN960JD616	WASHER
30			1	* D2896-1	SUPPORT
31			2	* D2856-600-1009	ABRASION STRIP
32			2	* D3595-063-570	RUBBER CUSHION
33			4	* MS21920-28	CLAMP
34			2	* MS21920-30	CLAMP (OR MS21042-32)
35			4	AN6-40A	BOLT
36			2	AN6-41A	BOLT
37			6	MS21042L6	NUT (OR MS21042-6)
38			18	AN960JD616	WASHER
39			2	* D3189-1	CHAFING SHIELD
50	1	1		D3428-1	PLACARD

\*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-141/-241 OR D412-664-243 ASSEMBLIES ABOVE  
NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AA  
SKIDTUBES.



## LIQUID PENETRANT TEST REPORT

P- 14947

CLIENT DART Aerospace DATE Aug 18-2009 PAGE 1 OF 1  
ATTENTION LINDA / CHANTAL ACUREN JOB NO. 188-09-001487 TIME AM ☒ PM ☐  
ADDRESS 1270 AREDEEN ST. PO/WO NO. 10220  
HAWKES BURY ON K6H 1K7 WORK LOCATION HAWKES BURY SHOP  
ACCEPTANCE STD. ASTM 1417 REV./DATE 2007  
PROJECT F.P.I. ON MACHINED PARTS AND CROSS TUBES  
ITEM(S) EXAMINED 34 ITEMS

JOB DESCRIPTION \_\_\_\_\_ PROCEDURE NO. LT-1002 REV./DATE \_\_\_\_\_ TECHNIQUE NO. LT-1002 REV./DATE \_\_\_\_\_  
PART NO. \_\_\_\_\_ MATERIAL STAINLESS STEEL THICKNESS ALUMINE ALUMINUM  
SCOPE WET FLOURESCENT LIQUID PENETRANT INSPECTION CARRIED OUT  
100% EXTERNAL

TEST DETAILS  
METHOD ☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED  
FAMILY BRAND MAGNAFLUX BLACK LIGHT S/N 16454 ☐ OUTPUT > 1000  $\mu$ W/cm<sup>2</sup> ☐ AMBIENT < 2 fc  
PENETRANT 2L67 MINIMUM DWELL TIME 45 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE  
PENETRANT REMOVER H2O MINIMUM DRY TIME >10 MIN. OTHER LABINO  
DEVELOPER SKD 52 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N \_\_\_\_\_ CAL DUE DATE DEC. 8-2009  
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

TEST SURFACE  
SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☐ CLEAN BARE METAL  
SURFACE TEMPERATURE ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/50°F ☐ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- ( ☐ METRIC ☐ IMPERIAL )  

ITEM	COMMENTS	ACCEPT	REJECT
1- CROSS TUBE .W.O. 50803		✓	
1- CROSS TUBE .W.O. 50802		✓	
1- CROSS TUBE .W.O. 51082		✓	
1- CROSS TUBE .W.O. 51081		✓	
1- CROSS TUBE .W.O. 51080		✓	
1- CROSS TUBE .W.O. 50804		✓	
1- CROSS TUBE .W.O. 50981		✓	
1- CROSS TUBE .W.O. 50980		✓	
7- STUDS .W.O. 50931		✓	
16- STUDS .W.O. 50936		✓	

ALL PARTS EXAMINED ON THIS  
REPORT HAVE BEEN FOUND  
ACCEPTABLE TO STD.  
MAY 09 08 19

Scope of Services  
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.  
Standard of Care  
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES  
CLIENT REPRESENTATIVE MATT MURDOCH SIGNATURE Matthew Murdoch DTR # E-20071  
TECHNICIAN (SIGNATURE): M. Keith Johnston REPORT REVIEWED BY: \_\_\_\_\_  
NAME (PRINT): M. Keith Johnston NAME \_\_\_\_\_ INITIALS \_\_\_\_\_  
1<sup>ST</sup> TECHNICIAN 2<sup>ND</sup> TECHNICIAN  
CGSB LEVEL II SNT LEVEL \_\_\_\_\_ CGSB LEVEL \_\_\_\_\_ SNT LEVEL \_\_\_\_\_  
CGSB REG. No 6066 CGSB REG. No \_\_\_\_\_